Large Generative AI Models for Telecom: The Next Big Thing?

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Abstract

The evolution of generative artificial intelligence (GenAI) constitutes a turning point in reshaping the future of technology in different aspects. Wireless networks, in particular, with the blooming of self-evolving networks, represent a rich field for exploiting GenAI and reaping several benefits that can fundamentally change the way wireless networks are designed and operated nowadays. To be specific, large GenAI models are envisioned to open up a new era of autonomous wireless networks, in which multi-modal GenAI models trained over various Telecom data, can be fine-tuned to perform several downstream tasks, eliminating the need for building and training dedicated AI models for each specific task, and paving the way for the realization of artificial general intelligence (AGI)-empowered wireless networks. In this article, we aim to unfold the opportunities that can be reaped from integrating large GenAI models into the Telecom domain. In particular, we first highlight the applications of large GenAI models in future wireless networks, defining potential use-cases and revealing insights on the associated theoretical and practical challenges. Furthermore, we unveil how 6G can open up new opportunities through connecting multiple on-device large GenAI models, and hence, pave the way to the collective intelligence paradigm. Finally, we put a forward-looking vision of how large GenAI models will be the key to realize self-evolving networks.